

REMARKS

Claims 1-15 are pending in the case. All claims stand rejected. In the present submission, claim 1 has been amended to include the claim limitation of claim 2 and claim 2 has been cancelled. Reconsideration is respectfully requested.

§102(b) Rejection

Claims 1, 2, 6, 8, 9, 14 and 15 are rejected under 35 U.S.C. §102(b) as being anticipated by Ueno et al. (US 5,334,829; hereinafter “Ueno”). Claim 2 has been cancelled and the rejection as to claim 2 is therefore moot. The Examiner contends that Ueno discloses all the limitations of the rejected claims. Applicant respectfully traverses the rejection.

Ueno describes a CCD image sensor including a solid state imaging device (a chip 1) and a package 2. As shown in both Figures 1 and 4 of Ueno, the CCD chip 1 is mounted on a substrate electrode 3 (see col. 4, lines 13-15, of Ueno). **A heating device 5 is disposed on the lower surface of the substrate electrode 3 through an insulating material 4** (see col. 4, lines 16-19, of Ueno). In the embodiment shown in Figure 1, the heating device 5 is formed on the upper surface of an insulating body 6. In the embodiment shown in Figure 4, the **resistance pattern 7 is formed on the lower surface of the insulating material 4 to construct the heating device 5** (see col. 5, lines 20-31, of Ueno). The embodiment in Figure 4 eliminates the insulating body 6 and thus the image sensor can be made smaller.

Claim 1 has been amended to include the limitations of claim 2. Claim 1, as amended, recites:

1. An integrated circuit package for an image sensor chip, the image sensor chip including a sensor area for sensing incident light and a circuitry area, the package comprising:

a substrate including a first surface for receiving an image sensor chip and a second surface having an array of contact terminals formed thereon; and

a heater element having a first terminal and a second terminal coupled to a first contact terminal and a second contact terminal, respectively, of the array of contact terminals, the heater element being positioned on the first surface of the substrate and

underneath the sensor area of the image sensor chip to be assembled in the package,

wherein the heater element provides heating of the sensor area of the image sensor chip when a first voltage is applied across the first contact terminal and the second contact terminal; and

wherein the image sensor chip is attached to the first surface of the substrate so that the heater element is sandwiched between the sensor area of the image sensor chip and the first surface of the substrate. (Emphasis added.)

Claim 1 is patentable over Ueno at least by reciting “the heater element being positioned on the first surface of the substrate and underneath the sensor area of the image sensor chip to be assembled in the package” and “the image sensor chip is attached to the first surface of the substrate so that the heater element is sandwiched between the sensor area of the image sensor chip and the first surface of the substrate.” In the integrated circuit package of claim 1, the heater is disposed on the surface of the substrate which also receives the image sensor chip. Thus, when the package is formed, the image sensor chip (102) is formed on top of the **heater element** 110 which is in turn **formed on top of the substrate** (106). As thus formed, the heater element is sandwiched between the image sensor chip (102) and the substrate (106) (refer to Figure 2 of Applicant’s specification). The heater element of claim 1 is therefore in direct thermal contact with the image sensor chip without any intervening layers.

Ueno, to the contrary, describes forming the heating device (5) **under** the substrate (3). In the embodiment shown in Fig. 4 of Ueno, the heating device (5) is formed **under** the insulating material 4. Thus, in the structure of Ueno, the heating device is **NOT** sandwiched between the image sensor chip and the substrate. Rather, Ueno describes forming the heating device underneath the substrate. Ueno fails to teach or suggest the limitations of claim 1 where the heater element is sandwiched between the image sensor chip and the substrate.

For at least the above reasons, claim 1 is patentable over Ueno. Claims 6, 8, 9, 14 and 15, dependent upon claim 1, are patentable over the cited reference at least for the same reasons claim 1 is patentable. Withdrawal of the §102(b) rejection is respectfully requested.

§103(a) Rejection

Claim 3 is rejected under 35 U.S.C. §103(a) as being unpatentable over Ueno in view of Anton (US 2003/0089957 A1). Claims 4 and 5 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ueno. Claim 7 is rejected under 35 U.S.C. §103(a) as being unpatentable over Ueno in view of Ozimek et al. (US 5,865,935). Claim 10 is rejected under 35 U.S.C. §103(a) as being unpatentable over Ueno in view of Ito et al. (US 2003/0164365 A1). Claims 11-13 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ueno in view of Barlow et al. (US 4,420,261; hereinafter “Barlow”). Applicant respectfully traverses the rejection.

Claims 3-5, 7, 10 and 11-13, dependent upon claim 1, are patentable over Ueno at least for the same reasons claim 1 is patentable. The cited references do not cure the deficiency of Ueno. Claims 3-5, 7, 10 and 11-13 are therefore patentable over the cited references.

With regard to claims 11-13, the claims are patentable over Ueno and Barlow for the additional reason that Barlow does not teach or suggesting providing protection resistors for a heater element. Barlow in Figure 6 illustrates an amplifier 77 including “two 470 ohm resistors, 102 and 103, together with diodes 104 and 106 (1N914)” for protecting the output against static electric discharges or other accidental stress (see Barlow, col. 11, lines 37-40). Therefore, while Barlow describes providing protection resistors for an amplifier, Barlow does not teach or suggest that the same protection resistors can be applied to a heater element.

For the reasons stated above, withdrawal of the §103(a) rejection is respectfully requested.

CONCLUSION

After the present amendment, claims 1, 3-15 are pending in the present application. For the reasons stated above, the claims are patentable over the cited references and are in condition for allowance. If the Examiner would like to discuss any aspect of this application, the Examiner is invited to contact the undersigned at (408) 382-0480.

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